**Tragedy of the Commons***3.2.5 Explain the concept of sustainability in terms of natural capitol and natural income.  
3.2.6 Calculate and explain sustainable yield from given data.  
3.5.1 Outline the issues involved in the imbalance in global food supply.***Purpose:**  
The purpose of this simulation is to explore how resources are used when they are available to multiple parties.

**Procedure:**    
Divide into groups of 4. Each group should sit in a circle around the "lake". The goal of this activity is to see how each of you will behave when resources are not privately owned. The fish represent resources that can be harvested from the lake. Each fish is worth $10. The more fish you catch, the more money you will receive. You must fish by sucking up the "fish" from the "lake" with straws.  You will get a chance to fish once a year (which lasts one minute) to determine your income for the year. You should rotate your fishing order every year so that everyone has a chance to go first.  **It is your choice of how many fish you take, however, you must catch at least one fish to stay afloat.**Each fishing session represents one generation of fish. The fish in your lake will reproduce once a year. [See your teacher at the end of each year - each remaining fish is able to spontaneously reproduce and make one new fish (4 fish become 8, i.e., to a maximum of 16, which is the carrying capacity of the lake)]. Keep the fish that you "catch" in front of you.  When your group runs out of fish, the game is over for you.

**Fish Data Table: Round 1 Blind fishing. No talking allowed!**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year # | # of Fish at beginning of year | # of fish taken by 1st fisher | # of fish taken by 1st fisher | # of fish taken by 1st fisher | # of fish taken by 1st fisher | Total fish left at end of year |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| Total | XXXX |  |  |  |  | XXXX |

Group Totals:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name |  |  |  |  |
| Total Fish Harvest |  |  |  |  |
| Total Income |  |  |  |  |

**Fish Data Table: Round 2 Open fishing. Free exchange of information encouraged!**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Year # | # of Fish at beginning of year | # of fish taken by 1st fisher | # of fish taken by 1st fisher | # of fish taken by 1st fisher | # of fish taken by 1st fisher | Total fish left at end of year |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| Total | XXXX |  |  |  |  | XXXX |

Group Totals:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name |  |  |  |  |
| Total Fish Harvest |  |  |  |  |
| Total Income |  |  |  |  |

**Calculate the Sustainable Yield for the population of fish in your lake:**

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FYI

Each goldfish cracker has the following vital statistics:

* Each fish has a biomass of 980mg
* Each fish has is 4 calories of energy
* The population begins with 16 fish
* At the end of the season, all live fish will have one offspring
* t= the starting time
* t+1= the end of a season without fishing

**Analysis & Discussion Questions:**

1. Did anyone in your group take too many fish? How did that make you feel? Did everyone try to take as many as possible? Why or Why not? Does society reward those with the "most"?
2. Did anyone sacrifice the # of fish, for the good of the community? Why or why not? Does society ever reward that type of person?
3. During round 2, did your group discuss your actions and strategies before each harvest? If so, briefly relate the discussion. Did each member carry out the plan that was discussed?
4. In Game Two... **how** did your strategy change, if at all? Does it make a difference to know what the rewards are?
5. Think of a **local commons** that you are familiar with. [parking lots, bathrooms, Cafeteria,, etc.] Do similar situations arise? Explain. HOW might those problems be solved?
6. What are some **natural resources** that are **common** resources?
7. What are the **global commons?** Are these being used wisely? Why or why not?
8. Explain how global food supply is an example of the tragedy of the commons.